Report of NHLBI Workshop

On

"Recruitment and Retention of African Americans, Hispanic Americans, and Native Americans

In Scientific Research Careers Relevant to Heart, Lung, Blood, and Sleep Disorders

What Works, What Doesn't, and What Should We Do?"

Held May 24-25, 2001 in Bethesda, Maryland

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WORKSHOP REPORT

Introduction

Dr. Claude Lenfant, Director of the National Heart, Lung, and Blood Institute (NHLBI) welcomed workshop participants and informed them that a primary goal of the workshop is for the participants to formulate innovative and culturally-specific strategies for recruiting and retaining minorities in research. Dr. Lenfant charged participants with developing concrete recommendations for improving the NHLBI programs, especially those tailored to recruit and retain minority students and scientists. While the NHLBI has a number of programs to increase minority participation in biomedical research and has often taken a leadership role in these issues, the Institute is concerned about the lack of progress in many areas. The first day's program was devoted to descriptions of different approaches employed by some foundations, academic institutions and government agencies, and to presentations of background data that described the current state of minorities in scientific research careers. The breakout groups in the latter half of the first day were designed to develop culturally directed recommendations. On the second day, the breakout groups continued their discussions, finalized their respective recommendations, and presented synopses of their discussions. (See Workshop Agenda in Appendix 1.)

Session I: The Problem and the Pipeline

Dr. Cage Johnson of the University of Southern California was the moderator for this session that included Dr. Jean Flagg-Newton from the National Center on Minority Health and Health Disparities who spoke on the scope of the problem and Dr. Nirmala Kannankutty from the National Science Foundation who presented data on the science pipeline. Although slow progress is being made in recruitment and retention of African Americans and Hispanic Americans into careers in science, the data indicate that progress for Native Americans is relatively flat or there is little data available. Source data for the latter presentation is at http://www.nsf.gov/sbe/srs/stats.htm .

Session II: Building to the Future, Part I

Dr. John Graham of the University of California at Irvine addressed the issue of culturally-appropriate marketing to minorities. He noted that current recruitment and retention programs for minorities rarely incorporate marketing principles. Successful marketing across cultures begins with an understanding of culture as defined by values, beliefs, behaviors, and expectations that are learned, shared by a group of people, and transmitted from generation to generation. Approaches to recruitment and retention must consider these issues, address the importance of language, and include not only the individual, but also the family and the wider community including religious institutions, school, local media, peers, and role models. While documented rewards for businesses that embrace diversity have provided an incentive for corporate America to increase minority representation, significant institutional barriers within academia still impede progress in these environments. If scientific careers are to become as attractive to minorities as careers in other fields, minority faculty in academic institutions need more opportunities for career advancement.

Session III: Student Perspectives

Three students (an African American, an Hispanic American and a Native American) related personal experiences about building careers in medical science. Mr. Patrick Hines is an M.D./Ph.D. candidate at the University of North Carolina. Ms. Edna Gordian is an undergraduate student at the University of Puerto Rico who will be entering graduate school at Indiana University in September 2001. Dr. Patricia Nez Henderson is an Assistant Professor at the University of Colorado, Health Sciences Center, and Assistant Vice-President for Research at the Black Hills Center for American Indian Health. These individuals talked about the problems and barriers they faced in their studies and career paths; the strategies they used to solve these problems and overcome the barriers; and their different cultural needs in reaching their goals. These eloquent presentations put a human face on the challenges minorities face pursuing a career in science. Common themes expressed by these speakers included the loneliness in being a minority, the perceived lower performance expectations for minorities, the perseverance required to continue despite mentors who are often less than encouraging, and the need for a sense of community and collegial networks during the process. According to these speakers, outreach programs provide the impetus for choosing a career in science.

These themes were echoed by Dr. James R. Gavin of the Howard Hughes Medical Institute (HHMI) who gave a moving and entertaining talk after the dinner that concluded the first day's proceedings. He reviewed personal experiences that led him to conclude that a supportive and enabling mentor is the most critical element in a minority student's successful career in scientific research. Building the mentor relationship has become the basis of HHMI programs in this area.

In aggregate, these four presentations emphasized the triple jeopardy for a minority individual seeking a career in science: (1) the inherent loneliness of the training experience is magnified several-fold; (2) stereotypes often shape career expectations; and (3) interactions with mentors are often influenced by these same stereotypes causing some minority students or investigators to leave a field of study or academic appointment. A strong, supportive mentor, individual perseverance and a network of peers and advisors appear to be viable antidotes until systematic changes occur in many institutions.

Session IV: Innovative NIH Programs

This session moderated by, Dr. Patrice Desvigne-Nickens of the National Heart, Lung, and Blood Institute,included a review of the programs of the National Institute of General Medical Sciences (NIGMS) by Dr. Clifton Poodry, those of the National Cancer Institute (NCI) by Dr. Sanya Springfield, and those of the National Institute of Mental Health (NIMH) by Dr. Enid Light.

1. National Institute of General Medical Sciences MARC and MBRS Programs

Dr. Poodry discussed the guiding principles and strategies used in revamping the Minority Access to Research Careers (MARC) and the Minority Biomedical Research Support (MBRS) programs. These longstanding NIGMS-sponsored programs are designed to provide support and training for minorities in biomedical research. The applicants evaluate their needs, then they develop a plan to address those needs, describe their goals and objectives, describe the

methods to achieve those goals and objectives, have measurable outcomes and milestones, and finally describe the manner in which they will evaluate their efforts.

2. National Cancer Institute Comprehensive Minority Biomedical Branch

Dr. Springfield noted that NCI has consolidated its minority programs into the Comprehensive Minority Biomedical Branch, under the Director of Centers Training and Resources, Office of the Deputy Director for Extramural Sciences. Of special interest is NCI's Continuing Umbrella of Research Experience (CURE) award that exposes promising students at the high school and undergraduate levels to cancer research. The CURE program provides opportunities for participation in cancer research from the high school to the investigator level. The trainees learn, among others things, how to write and review grant applications. NCI has also initiated, "The Bridge to the CURE", designed to develop the research capabilities of Historically Black Colleges and Universities (HBCUs), Hispanic Serving Institutions (HSIs), and Tribal Colleges and Universities (TCUs). NCI also provides Training and Career (R25) Supplements for predoctoral and postdoctoral training, and provides Institutional Clinical Investigator postdoctoral training Supplements (K12) for minority students.

3. National Institute of Mental Health Initiatives

Dr. Light discussed the special NIMH initiatives that target minorities, including college honors programs at Historically Black Colleges and Universities (HBCUs), and 10- to 12-week summer programs at universities. NIMH has also taken steps to encourage effective working relationships between Program Staff and minority grantees and supplement awardees. The NIMH holds an annual workshop and funds minorities' attendance, and contacts supplement awardees to obtain feedback on how their training is proceeding.

Session V: Innovative Private & Public Programs

Dr. Jared B. Jobe of the National Heart, Lung, and Blood Institute moderated this session which focused on six organizations' programs of that either directly or indirectly relate to recruitment and training of minorities.

1. The Sophie Davis School of Biomedical Education, (CUNY), NY

Dr. Louis L Cregler, (CUNY), described the Sophie Davis Program that provides a seven-year integrated BS/MD degree for residents of New York state. Selected students enter the program directly from high school and, after completing the first five years at the program which includes two years of pre-clinical medical education, transfer to one of six cooperating medical schools in New York state. After obtaining their medical degrees, they are required to work for two years in a medically-underserved area of New York state.

2. The W.K. Kellogg Foundation

Dr. Gloria Smith of the W.K. Kellogg Foundation described three programs. *The Community Health Scholar's Program* is designed to increase the number of faculty at health professional schools. One or two year postdoctoral fellowships are awarded to develop skills in community-based research. Mentoring and networking among scholars and faculty are important

components of this program. *The National Medical Fellowship Program*, which supports doctoral fellows at several medical schools, prepares policy researchers and evaluators to work with poor, minority and underserved communities. *The Kellogg Center for the Advancement of Health*, which supports Health Disparity Fellows at The University of Michigan, Harvard, and Morgan State University, facilitates collaboration among national and international institutions working on health inequities.

3. The St. Scholastica Program

Dr. Chandra Mehrotra, of the College of St. Scholastica, described a program that develops a community of scholars in the psychology of aging, which has relevance to training special groups such as minorities. Teaching and mentorship are provided to junior faculty members from non-research intensive colleges and universities by participating senior scientists from other institutions, and the National Institute on Aging (NIA) program staff. The training is provided during a two-week summer course in the first year, a three-day winter session, and a one-week course in the summer of the second year. Trainees are expected to submit a grant application within one year after completing their second year of training. The success rates of each cohort are tracked continuously.

4. University of Colorado Native American and Alaska/Native Programs

Dr. Spero Manson, of the University of Colorado Health Sciences Center, described seven programs collectively called the Division of American Indian and Alaska Native Programs (DAIANP). These programs are designed to promote the health and well-being of American Indians and Alaska Natives (AI/AN) by supporting research, training, continuing education, technical assistance, and information dissemination in the context of the unique culture of these special populations. These inter-related components provide mentoring experiences to AI/AN students in mental health, public health, and biostatistics.

5. The American Psychological Association Minority Fellowship Program

Dr. Kim Nickerson of the American Psychological Association (APA) described the APA Minority Fellowship Program designed to increase the number of minority researchers and practitioners in psychological and neurological sciences. The one-week Summer Institute retreat introduces graduate and undergraduate students to research through didactic seminars, group mentoring, and multimedia exercises. The Program funds fellowships to practitioners and researchers to pursue doctoral degrees in mental health and substance abuse services, and for predoctoral and postdoctoral trainees to continue their studies..

6. Weill Cornell/Rockefeller/Sloan-Kettering Gateways to the Laboratory Program

Ms. Ruth Gotian, of Cornell University, described the Gateways program, an MD-PhD program sponsored by the three above named institutions. This program, designed for underrepresented minority freshman and sophomore college students, offers a ten-week summer research and enrichment experience for students considering a seven-year MD-PhD enrollment. Program highlights include an independent research project, a journal club, clinical and specialty rounds, mock Medical College Admission Test (MCAT), career development workshops, social events, big brothers/big sisters, parental involvement, and final

presentations. A number of graduates of this program were admitted to the three institutions' MD-PhD programs.

Sessions VI and VII: Building to the Future, Part II and Recommendations

1. Introduction

This session consisted of three breakout group discussions, one for each of the underrepresented minority groups. The groups were co-led by two facilitators from the NHLBI.

The NHLBI co-facilitators for each group opened the session by briefing their respective groups on the purpose of the session. Each group began its discussions by introducing the members, and by selecting a recorder and leader. The groups then considered and discussed four questions:

1) What are the major barriers to recruiting minorities into research careers?

2) What are the major barriers to retention of minorities in scientific research careers?

3) What are the cultural, ethnic, and economic issues that need to be addressed in the recruitment and retention of minority individuals in scientific careers?

4) What should NHLBI do to overcome the barriers and enhance recruitment and retention of Hispanics to scientific research careers?

2. African American Breakout Group

Dr. Joyce Hunter and Dr. John Fakunding were the NHLBI co-facilitators for the African American breakout group. Dr. Sandra Harris-Hooker of the Morehouse School of Medicine was selected as the recorder and Dr. James Phillips of the Baylor College of Medicine was selected to present the group's discussion and recommendations.

Barriers to Recruitment: The discussion of barriers to recruitment of African American individuals into biomedical science touched on a number of important topics. The group noted that the African American community does not have a connection to a network of scientists. In addition, the lack of exposure to scientific resources and careers, and peer pressure not to excel in science are major barriers to early exposure to the sciences. African Americans are also being introduced to and encouraged to pursue careers that are more lucrative than science. African American women may be encouraged to consider parenthood and marriage in their career plans. Some African American parents do not consider biomedical research as a career opportunity and do not encourage their children to pursue such a career. This often stems from the lack of scientific knowledge and understanding of the biomedical sciences.

It was recognized that interventions to attract African American individuals to science need to start as early as elementary school because the greatest attrition occurs in these grades. There is also a lack of adequate exposure to the life sciences in high school and weak preparation of students from kindergarten through high school. At the undergraduate level, there are insufficient resources and research opportunities available to introduce the biomedical

sciences to students, and a lack of researchers and medical scientists in the African American community to serve as role models. Also discussed was the need to foster a culture of recognition of success/status.

Another barrier to African Americans pursuing careers in biomedical research is the lack of culturally-appropriate marketing of biomedical research to minorities. The barrier to the pursuit of a science career revolves around getting the word out to the community. There is a lack of attention to science careers from health advisors, guidance counselors, as well as parents, with students being directed to medicine, rather than scientific research or graduate school. Moreover, there is a lack of adequate literature to highlight the role of the biomedical investigator or researcher for students to access. There was a fair amount of discussion about the need to focus on those students, who may not demonstrate superior academic skills (students with 2.5-3.0 GPA) or who have taken a wrong path. Often, students, parents and teachers have low expectations of these students, but such students may truly excel if given the proper attention and assistance.

Barriers to Retention: Discussants noted that racism is still a barrier to the retention of African American individuals in biomedical science careers. There is a lack of institutional support, in the form of counselors, help for students, role models and mentoring. Additionally, African American students, at an institution, may have some discomfort because of the lack of other African American students with whom to form networks and gain support. In particular, it was noted that there may be a lack of support systems for black women who may feel societal pressures and who feel pulled in other directions. It was noted that a career in science has a delayed gratification which can be a disincentive to pursue a career in science. This combined with a perceived need to earn money quickly can become a barrier. Within an educational institution, there are inadequate advisors, support systems and role models for African American students. At the academic level, lack of understanding institutional politics can be a hindrance to advancement for new African American faculty, and they can be subject to numerous competing demands.

Cultural, Ethnic, and Economic Issues: The lack of knowledge pertaining to scientific research within the African American community can act as a barrier. There are community notions of scientists that can act as a barrier. In addition, science can be seen as a foreign environment, such that there may be an avoidance of math and science. In the schools, there may be a lack of expectation for students to excel in science by instructors and advisors. Often, there is a need for economic support by students which prevents them from pursuing careers in science. Parental influence is seen as particularly important. With a trend towards single parent households, with the lack of a concerted influence of both parents, it may be more difficult for students to choose or stay with a science career.

Recommendations: Based on these issues the African American Breakout Group proposed a set of specific recommendations to increase the number and quality of African Americans in scientific research.

1. Marketing:
    - NHLBI should focus educational/promotional efforts on recruitment and retention especially at Kindergarten through the postdoctoral level
    - Advertisement in minority targeted publications, non-traditional sources

There is a need for marketing to increase awareness both within the minority and majority communities. Educational/public relations programs from NHLBI through OPEC can highlight scientific careers. OPEC's expertise should be utilized to highlight scientific careers and develop programs that will present science careers in a positive light, particularly with the African American community. Programs could be produced for use and dissemination at the local level. In particular, advertisement needs to be targeted to a minority audience. The use of minority targeted media and non-traditional media, such as Black Entertainment Television (BET) should be considered. Training directors and grantees need to be required to advertise training positions in print or on the web with funds provided. This latter effort may be an area where the NHLBI may play a coordinating role.

2. NHLBI should have a designated office of minority coordinator who would:

- Be responsible for overseeing minority research and training efforts (i.e., recruitment and retention)
- Establish visits to summer programs
- Foster new networks and identify existing networks
- Have appropriate resources and visibility within NHLBI

3. NHLBI should develop summer research training programs for high school students and teachers, such as the Minority High School Student Research Apprentice Program (MHSSRAP).

- Design realistic evaluation criteria (for example number of students going into college, etc.)
- Need clearly identified objectives

Summer research programs for high school students and teachers are seen as valuable and deserving of support. The focus of these programs and their evaluation should not be on the receipt of grants, but should be broader, including efforts for getting students into college or training programs. The program would need clearly defined objectives and realistic means of measuring success. A program such as this can have a significant long range impact.

4. NHLBI should support a mechanism for scientists to visit schools to enhance training of science teachers and counselors.

NIH or the NHLBI could sponsor a week-long enrichment program on the NIH campus that would allow guidance counselors and science teachers to take part. Consideration should also be given to supporting local enrichment programs that focus on advisors and teachers in different geographical areas. Such a program might include a feasibility study or pilot program. The NHLBI could also consider funding career development programs for individuals who wish to act as mentors to minority students.

5. NHLBI should utilize a mechanism such as Centers of Excellence to coordinate:

- Summer training
- School year training
- Recruitment and retention efforts

- Resource center
- Advising – debt forgiveness, career planning, test preparation
- Longitudinal model (K-12, college, graduate)

NHLBI should provide support for the National Center for Minority Health and Health Disparities (NCMHHD) Centers of Excellence which will include longitudinal (K through 12, undergraduate and graduate) efforts at outreach and training. These Centers should include advising, counseling, and distance learning courses. NHLBI should also provide additional support for training on large grants including networks, SCORs, and large clinical studies with a focus on minority training and recruitment.

6. NHLBI should develop and implement guidelines for review and evaluation of research grants that support graduate students and postdoctoral fellows, which includes an assessment of the training benefits.

In addition to a review of scientific technical merit, competing renewal grants should be judged on their training plans. Requiring applicants to explicitly focus on mentoring and training on research grants would raise the level of attention that training efforts receive.

7. NHLBI should create mechanisms to support minority faculty or science faculty at minority serving institutions through:

- Sabbaticals for research training
- Support for research upon return

This support should consider inclusion of short-term research support once the sabbatical has been completed. One such model is the St. Scholastica model.

8. NHLBI should create a transition grant for young investigators.

Create a grant mechanism that allows postdoctoral fellows to transition into an independent research careers at an academic institution or research center. This would be similar to the K22 program for the intramural program. This should include a debt reduction program for underrepresented minority students.

9. NHLBI should create a national mentoring program to retain young investigators which would:

- Emphasize role of mentoring and mentors
- Provide tools for career development and advancement including survival skills, networking and grantsmanship
- Focus on ways to recruit and retain individuals in biomedical sciences

10. NHLBI should include funds for salary support for mentors and training faculty on Training Grants.

NHLBI and NIH need to provide salary support on training grants for Program Directors and faculty that are involved in training. Special requirements should be incorporated to also provide support for staff responsible for recruitment and retention; mechanisms for students to organize and develop networks; and to evaluate what the institution is doing to help students.

Because there is a need to look at long range effects of training, not just single interventions, existing or newly developed training programs should focus on a career continuum. In particular, training programs that focus on African Americans and underrepresented minorities from high school through the post graduate level should be encouraged.

3. Hispanic American Breakout Group

Dr. Sri Ram and Dr. Ellen Werner were the NHLBI co-facilitators for the Hispanic American breakout group. Dr. Tanya Pagan Raggio, of the Department of Community Health and Social Medicine at the Sophie Davis School at City University of New York Medical School, volunteered to be the group's recorder, and Dr. Michael Bedolla, of the Health Careers Opportunities Program at the University of Texas Health Science Center at San Antonio, agreed to present the group's discussion and recommendations.

The Hispanic American Breakout Group identified four major barriers to recruitment and retention of minorities in biomedical careers:

- Lack of adequate mentoring;
- Lack of NIH policies and guidelines that ensure grantee institutions have in place adequate plans for developing good mentors who in turn provide necessary training for their mentees;
- Lack of adequate facilities and curricula in grades K-12 science education to help increase minority student interest in science and encourage their entry into heart, lung, and blood related research careers and pipeline; and
- the cultural, ethnic, and linguistic diversity of Hispanics-Americans.

Barriers to Recruitment: Good mentoring was viewed as the most important facilitating factor in recruitment and retention of minorities; poor mentoring is the most significant barrier. Lack of effective means for recruitment and training of committed mentors is impeding progress in recruiting and retaining Hispanic American students and junior scientists into scientific careers. Mentors and trainees often do not know of the variety of funding mechanisms available to support students and scientists at various levels of the career ladder, in general and for minorities in particular. For example many mentors have not heard of the minority research supplements, although these programs designed especially for minority students and investigators have been in existence for a couple of decades. Some participants felt that NHLBI should consider developing grant award guidelines that promote good mentoring and deter poor mentoring.

Effective mentoring is a bidirectional process; both the mentors and mentees should know the rules of good mentoring that ensure acceptable behaviors and attitudes on the part of both mentors and trainees. Deficits in good mentoring skills, in general, are a problem for trainees regardless of race/ethnicity/culture.

The group felt that a two-pronged approach is needed for training mentors. First, potential mentors need training in generic mentoring skills as well as in the NIH funding mechanisms available for all trainees in general and for minorities in particular.

Medical and graduate school authorities often give Hispanics the impression that they do not want to deal with complexities that underrepresented minorities bring to their systems that are

designed for and work efficiently with the majority white population. Institutional rigidity, isolation of minority students and acceptance of only a small number of students out of many that are interviewed, conspire to keep the numbers of minority students and junior investigators extremely low. Innate norms of respect for authority deters Hispanic students from seeking help. When the number of Hispanics in an institution is very small, it is difficult for the Hispanic students to develop a viable support system, and they begin to feel that they have to struggle in a "hostile environment."

Primary and secondary science education is inadequate especially in poor independent school districts which offer little or nothing to attract children to science. Only vigorous funding and marketing programs can meet current deficiencies which include, for example, lack of access to computers, poor equipment and facilities, and inappropriate curricula.

Barriers to Retention: Presently NIH has no policy in place to deal with institutional politics that might impede the retention of Hispanic scientists who manage to enter into the research career path. No current NIH training grant mechanism provides funds for mentoring (e.g., T32). The T32 grant would foster better mentoring if it provided funds for mentors. Another problem is accountability. When a minority candidate receives a K award with protected time for his/her training and research, there is no one that the minority candidate can turn to, if he/she finds that administrative constraints and other duties nullify the protected research/training time. There is no NIH ombudsman or anyone to turn to for help and redress.

Lack of promotions and inadequate monetary compensations based on race/ethnicity still pose another problem. The Hispanic breakout group discussed many cases where an Hispanic scientist became frustrated and left academia for industry with offers of more money and opportunity. Even in the case of minority research supplements, this group knows of instances of Principal Investigators obtaining minority supplements only for the purpose of gaining technical help, rather than for "recruiting" and training an underrepresented minority candidate into biomedical research. Again, lack of awareness of funding opportunities and resources in general, and for minorities in particular, inhibit career development of the minority candidate into an independent scientist. Poor mentoring and insensitive attitudes can ruin a good candidate with good potential. Some graduate students are forced to stay with a mentor with poor mentoring skills because of their need and desire for a position and/or a degree.

Cultural, Ethnic, Language and Economic Issues: Overarching and impacting on the issue of recruitment and retention of Hispanics into biomedical science careers are the cultural, ethnic, and language differences that separate them both from the majority white and other ethnic minorities.

Educators, mentors and administrators often lack awareness of the cultural diversity in the Hispanic community and an understanding of why it is important to have diversity in the science education, and health-care giving workforce. Cultural awareness and sensitivity are often lacking, even among administrators and mentors at institutions with a high Hispanic population. Hispanics are different from other ethnic groups in that they have differing views, values and traditions with regard to the importance of family, especially the role of parents in decision-making about their children's education and careers. Hispanic families, particularly those from impoverished backgrounds, with second or third grade education must be educated to recognize the importance of science education and convinced to encourage and help their

children to pursue a scientific research career, despite prolonged college and postgraduate training and slow evolution of material benefits. Many Hispanic students are terrified of the GRE examination. The so-called Standardized Testing for graduate and medical schools are another barrier. English language competency is needed for taking and passing these tests and this often poses a daunting problem for the Hispanic family. Special tutorial and other classes available to prepare students for these tests are expensive and beyond the means of the working poor Hispanics. The Hispanic community will greatly benefit from extracurricular hands-on science programs that educate parents on the value of science careers as a desirable profession.

The group recognized that the issue of demanding cultural sensitivity and awareness on the part of mentors and others is not without problems. Some felt that instituting bureaucratic standards for training in the cultural/ethnic diversity of Hispanics could develop a backlash and potentially derail the efforts to increase the number of Hispanics in scientific research careers. However, there was consensus that faculty and administrators should be required to meet certain minimal mentoring requirements.

Recommendations: Based on these issues the Hispanic American Breakout Group proposes a set of specific recommendations to increase the number and quality of Hispanic Americans in scientific research.

1. Mentoring - The NHLBI should take the following steps to develop good mentors, especially among its institutional training (T32) programs:

- Conduct workshops to instruct potential mentors in “best practices” in mentoring.
- Include, among the criteria for review of training and career development grant applications as well as non-competing renewals, experience and plans for developing good mentoring and accomplishments in this regard.
- Establish criteria that students can use to identify and select mentors with the requisite skills and appropriate characteristics, and to evaluate their mentors over the course of their training.

2. Assurance of Compliance:

- NHLBI should develop and enforce policies that assure compliance with best standards in mentoring. These assurances, should be a component of grant and contract agreements, and could be worded like other assurances for radiation safety, human subject protection, etc.
- Funds should be allocated to T32 Training Directors to develop and monitor appropriate mentoring programs for mentors and trainees. There should be mechanisms to allow investigation of bona fide complaints, and for auditing the institution’s mentoring practices by the NHLBI, with provisions for creating effective remedies in cases of infraction and for protecting the identities of individuals involved in both sides of the complaints. It was noted that the Robert Wood Johnson Foundation has procedures that can serve as a model for NHLBI to develop guidelines to address these issues in training and career development grants.

3. Development of Science Career Pipeline:
    - NHLBI should create a position similar to that of Chief, Comprehensive Minority Biomedical Branch, NCI, with responsibility and authority to develop and coordinate a balanced minority training programs.
    - NHLBI should collaborate with the Hispanic Association of Colleges and Universities (HACU), Historically Black Colleges and Universities and Tribal Colleges and Federal agencies, such as the Department of Education, for the purpose of developing, implementing and evaluating innovative programs to increase the potential pool of Hispanic research scientists. These programs should be designed to conduct outreach activities in grades K-12; and improve science faculties and facilities in local school districts.
    - NHLBI should develop a new supplement program (Minority Education supplements to enhance K-12 education and infrastructure), to enable Principal Investigators of NHLBI grants to participate or assist in the science education at local schools.
    - NHLBI should establish Centers of Excellence without walls, in Heart, Lung and Blood related science education, to partner with local school districts, colleges and universities to allow NHLBI-funded scientists to become adjunct faculty to acquaint and train the school faculty in the latest scientific developments.
    - NHLBI should develop short term transition programs to educate practicing clinicians and non-scientists on scientific research that targets health problems of Hispanics.

4. Marketing:
    - NHLBI should conduct aggressive marketing campaigns for all its research activities and funding mechanisms, and improve the interest of minority communities in scientific research careers
    - NHLBI should develop outreach programs to educate poor Hispanic parents/families on the value of science careers for their children.

4. American Indian/Alaska Native Breakout Group

Mr. Richard Fabsitz and Dr. Jared Jobe were the NHLBI co-facilitators for the American Indian/Alaska Native breakout group. Ms. Theresa Clay of the University of New Mexico School of Medicine was selected as the recorder and Dr. Lillian Tom-Orme of the Utah Department of Family & Preventive Medicine was selected to present the group's discussion and recommendations.

The American Indian/Alaska Native (AI/AN) Breakout Group began with a discussion of what is unique about American Indians/Alaska Natives that may require a specific approach. There are a number of characteristics that are unique to this group. First, the sovereign Nation status of Indian Tribes requires unique approaches to dealing with AI/AN communities. Congress has declared and the Department of Health and Human Services (DHHS) has affirmed in a recent report the need for government to government consultation when working with Indian communities and dealing with Indian issues. Second, the smaller numbers of AI/AN members ranging from 2.5 to 4.5 million means this group often is overlooked or lumped with others in statistical surveys or summary statistics as was illustrated in the opening talks of this workshop. In addition, this population experiences higher dropout rates from middle school and high

school, only limited opportunities for higher education, higher levels of poverty, and fewer opportunities for employment on or near the reservations or AI/AN communities. When AI/AN researchers have reached the doctorate level, they are often located in academic institutions away from AI/AN students and may represent the only AI/AN representative on the faculty. As a result, there are few AI/AN researchers, NIH grantee, or role models/mentors, and only a few research institutions that are AI/AN staffed and AI/AN focused to provide the infrastructure on which to establish a program for the recruitment and retention of AI/ANs in research careers.

Barriers to Recruitment: Barriers to recruitment exert their influence from the earliest ages. Elementary and secondary schools in AI/AN communities often lack strong programs in math and science that provide the foundation for higher education. Schools do not have programs for advanced placement in math and science from grades K-12 for those who are able to excel in these subjects. Parents have little involvement in the students' education due to low education levels. Exposure to research and to the scientific method is limited or non-existent in AI/AN communities. The exposure that is available often has negative connotations as a result of researchers who come and leave as soon as data are collected.

When students are motivated to pursue a scientific research career, they confront additional barriers. Tribal colleges and universities (TCUs) are not research intensive institutions. Many communities do not have ready access to a TCU. AI/AN scientist mentors and role models are not readily accessible to AI/AN students. Opportunity for exposure to health research may be most likely through the IHS physicians but they are consumed by overwhelming clinical responsibilities and unlikely to compete successfully for research funding or to find the time to complete such work.

Barriers to Retention: Barriers to retention are equally formidable. AI/AN students have only limited opportunities to explore scientific training because TCUs are not research institutions. When scientific research training is pursued, students must often leave home and their support system. At research intensive institutions they may be the only or one of only a small number of AI/AN students. AI/AN mentors and role models are equally lacking at these institutions. When students are successful in completing scientific research training, opportunities for employment close to home are lacking. TCUs and Tribes lack infrastructure to support scientific research, so projects are by necessity small and short term, and often result in poor outcomes. NIH research support is difficult without adequate infrastructure and a critical mass of investigators that is the rule for TCUs.

Cultural, Ethnic and Economic Issues: Cultural, ethnic and economic issues also serve as barriers to recruitment and retention of AI/AN investigators. Poor economic conditions mean that students often lack the funds to supplement scholarships in order to leave home for research intensive institutions. Systems for cultural and social support at the majority of institutions do not exist for AI/AN students. Family responsibilities often require more flexible approaches and additional travel funds that are not routinely found in the rigid schedules of academia or regulations of the NIH. AI/AN scientists bring a unique perspective to science in both type of research and research methods. Because of a lack of existing AI/AN research scientists, faculties often fail to appreciate AI/AN perspectives during training, and peer review groups often do not appreciate research questions and methods that are appropriate for research to be conducted effectively in AI/AN communities. Holistic approaches and qualitative methods are often more appropriate than most investigators and sponsors realize, and offer

complementary strengths to those of linear models and quantitative methods. Thoughtlessly employing standard questionnaires and data collection forms with AI/AN not only is likely to be culturally insensitive, but simply poor science.

AI/AN physicians who have completed their residency programs are the most academically prepared to enter research careers and pursue RO1 NIH research grants. There are currently 400 AI/AN physicians who are members of the Association of American Indian Physicians (AAIP) and are capable potential mentors to future AI/AN research trainees. They are the best potential future research trainees but they are channeled into clinical careers rather than research careers because of the Indian Health Service (IHS) 437 scholarship program which unfortunately forces them to perform clinical duties rather than research careers and training.

Recommendations: Based on these issues the AI/AN Breakout Group proposes a large set of specific recommendations to increase the number and quality of AI/ANs in scientific research careers.

1. Upgrade the TCUs to provide scientific research training.

Grants could be awarded to TCUs to set up partnerships with nearby research intensive institutions to build research laboratories at the TCUs and share faculty and students to upgrade opportunities for training.

2. Make site visits to AI/AN communities.

The federal government and private institutions should make a greater effort to visit AI/AN communities to experience the culture and teach grantsmanship so that two way training can occur. NHLBI should establish a liaison with the AI/AN community that would serve as a single source of information for those seeking assistance.

3. Adjust eligibility criteria for solicitations to include Tribes, TCUs, and AI/AN organizations.

The Institute should consider if some solicitations can be earmarked specifically for AI/ANs for an initial period. Alternatively, multi-phase solicitations and cooperative agreements could be used to provide training and build infrastructure in AI/AN communities. Other approaches to provide technical assistance might also be effective.

4. Support K-12 AI/AN schools to develop math and science courses.

AI/AN communities need support for K-12 AI/AN schools to develop math and science courses tailored to unique AI/AN learning styles. Existing researchers should visit schools and community meetings to serve as role models and to explain current research and promote the value of scientific thinking in communities.

5. Research projects conducted in AI/AN communities should include the community as a partner.

Research funded in AI/AN communities should include a community component to assure that there is community input in the conduct of the research. This is often necessary but rarely available through the R01 mechanism. Partnerships would be ideal.

6. Provide additional funds in training to AI/AN students for travel home and provide first payments early.

In training grants, support mechanisms for AI/AN students should be modified to provide first payments before the first day of school to provide for initial expenses. Funding should also provide funds for return visits to home to meet family and community responsibilities and to fill the gap in social support systems for AI/AN students.

7. Work with the IHS to encourage their physicians to apply for research grants.

To increase exposure to research and to mentors and role models, it would be helpful if the IHS would encourage their physicians to apply for research grants so more opportunities exist in AI/AN communities, however, time for their implementation by busy clinicians would also have to be part of such an action. NHLBI should develop a partnership with AI/AN organizations to increase research exposure and training opportunities. Examples include the United National Indian Tribal Youth, Inc. (UNITY) to provide funds for students to attend scientific conferences and mentor students, American Indian Science and Engineering Society (AISES) to recruit students for biomedical research, Association of American Indian Physicians (AAIP) to recruit peer reviewers and mentors, and programs like InMed and Headlands to support AI/AN physicians to conduct research. Programs and laws should be modified for approaches to pay back medical school support through research in AI/AN communities as equivalent to the practice of clinical medicine in those communities.

8. Create a traveling science exhibit that would visit TCUs and invite K-12 students to learn about science and scientific research.

The exhibit should be hands-on and include inquiry-based science activities for different age groups. Research grants for AI/AN research should include funds for mentoring young AI/AN investigators and for partnering with TCUs. Although mechanisms for some of these activities exist, greater emphasis should be placed on publicizing their existence.

9. Include funding to cover dissemination of results to students and communities for studies that are ongoing.

10. Extend marketing efforts beyond communities to TCUs and to AI/AN organizations outside of medicine.

11. Cofund efforts like the Native American Research Centers for Health (NARCH).

12. Establish programs to transition AI/AN students at 2-year TCUs to 4-year programs and then to graduate schools.

13. Extend mentoring of AI/AN students to include more effective use of layered mentoring.

14. Conduct mentoring of AI/AN students to specifically address AI/AN recruitment and retention rather than lumping them in with other groups.

15. Develop an infrastructure similar to the NCI Continuing Umbrella of Research Experiences (CURE) to support the recommendations discussed above.

Report on Feedback from the Website and Internet

1. Introduction

The idea of allowing meeting registrants and non-registrants the opportunity to provide input on issues relevant to the workshop arose during one of the workshop planning meetings. The Planning Committee realized that there is a larger community, possibly unidentified, that would be interested in the issues but could not participate. Also, participants may want to send additional comments after the workshop. With these target audiences in mind, a subcommittee volunteered to develop a website "Your Response and Advice" form.

The form lists four statements that reviewers can respond to, as shown below.

Website Form for Viewers Responses and Advice
"Recruitment" refers to outreach and networking activities that bring minorities into science and research at early and middle stages in their education and careers. Barriers to successful recruitment of minorities include:
"Retention" refers to successful mentoring, training and promoting minority scientific researchers who go on to become established researchers with NIH and other funding. Barriers to successful retention of minorities include:
There are the cultural, ethnic, and economic issues that need to be addressed in recruitment and retention of minority individuals in scientific research careers. These issues include:
The NHLBI can take specific actions to address these issues, such as:

Because of the importance of visual images and icons, the committee charged the Website developers from the Division of Blood Diseases and Resources with the task of finding culturally, racially and ethnically appropriate icons. The DBDR team obtained permission to use the icon used by the National Cancer Institute for a minority workshop in 1996.

The Workshop Website was located at "Committees, Meetings and Events" topic on the NHLBI website. This link permitted viewers to: (1) view the workshop agenda, breakout group

members, background papers; (2) register for the workshop; and (3) provide input on issues relevant to recruitment and retention of minorities in scientific research careers.

The subcommittee decided to keep the website active so that more responses could be transmitted to NHLBI, especially after the Workshop Summary is posted. The comments received to date are summarized below.

2. Barriers to Recruitment

Generally, these responses paralleled the breakout groups' concerns about mentoring, and science education. There is a lack of exposure to science. Both the lack of high visibility minority research scientists in senior positions and of training directors' personal involvement in outreach to local students (e.g., on NHLBI T32 Training Grants) impede flow of information about science and research careers. Good science education is lacking in middle and high schools. There is a "perception of science as an unattractive field with low potential for growth...the private sector...(is) a more attractive option."

3. Barriers to Retention

Hierarchical research teams and university positions reinforce the junior level status of minority scientists/professors. Subtle messages that communicate apathy to minority investigators are couched in statements that criticize a new investigator's publication record, or management of a young physician's patient caseload, or assignments to an assistant professor that are more appropriate for a fellow. Lack of access to a senior mentor (e.g., Training or Lab Director) prevent the hands-on mentoring that is vital to a new investigator's professional development.

4. Cultural, Ethnic, Language and Economic Issues

The culture of science has not permeated minority organizations, communities and the workforce. Lack of role models, interpersonal networks and visible science- or research-based programs that are not exploitative impede the penetration of science into people's everyday lives. Minority scientists are prone to the same health disparities, and at the same rate and level of severity as the minority population in general.

5. Recommendations

Mentoring: A hands-on, personal approach to meeting potential candidates and recruiting them into training programs was advocated. Strategies to maintain the personal contact must be maintained throughout training. Although other minority students faculty can provide social support, the training director's "PERSONAL involvement" is key in mentoring.

Science Education: Science education in K-12 should include interactions with research scientists. Representatives of all parties should be "at the table" to address the issues, and to assure that adequate funding will be available.

NHLBI Role: There is more that NHLBI can do to foster recruitment and retention of minorities. The Institute can take an active role in "DIRECTING minorities to...training programs," for example, by "sending several administrators to the minority institutions to talk to the students,

providing them with all (the training) sites and explaining the opportunities." Marketing campaigns should target minority students, their teachers, families and communities to inform them of those programs and fellowships that do exist. New benchmarks should be identified and used to evaluate progress in career development. Trans-Federal government and public-private alliances could assist in diffusion of scientific research into communities, thereby showing the importance of science in people's lives.

Summary Recommendations

I. Establish a minority coordinator position and a supporting infrastructure with responsibility and authority to develop, coordinate, and administer balanced training and career development programs for underrepresented minorities. Coordinator should have appropriate resources and visibility within NHLBI. Coordinator should foster new networks and identify existing networks. The source for culturally specific recommendations is indicated below by the following: AA=African American; AI/AN=American Indian/Alaskan Native; H=Hispanic.

   A. Explore having this unit assume responsibility for minority supplements, training positions on F31/F32s, T32/T35s, K01s, K08s, and K23s for minority candidates.

      1. Coordinator would be responsible for overseeing minority training efforts. (AA)

      2. Provide additional funds in training to AI/AN students for travel home and provide first payments early. In training grants, support mechanisms for AI/AN students should be modified to provide first payments before the first day of school to provide for initial expenses. Funding should also provide funds for return visits to home to meet family and community responsibilities and to fill the gap in social support systems for AI/AN students. (AI/AN)

      3. The establishment of networks should extend to having NHLBI ombudsman for minority recruitment and retention and general training at each academic institution having a strong training presence. (AA)

   B. Consider staffing the new unit with a representative for each of the three underrepresented minority groups.

   C. The new unit should also have sufficient travel resources to conduct outreach to minority institutions and investigators.

      1. Make site visits to AI/AN communities. The federal government and private institutions should make a greater effort to visit AI/AN communities to experience the culture and teach grantsmanship so that two way training can occur. NHLBI should establish a liaison with the AI/AN community that would serve as a single source of information for those seeking assistance. (AI/AN)

2. Coordinator should establish visits to summer programs. (AA)

D. The new unit should conduct program evaluation activities, conduct tracking activities, and fund an annual meeting of mentees and trainees.

1. NHLBI should develop summer research training programs for high school students, counselors and teachers. This would include designing realistic evaluation criteria (for example number of students going into college, etc.) and would require clearly identified objectives. Summer research programs for high school students and teachers, such as the Minority High School Student Research Apprentice Program (MHSSRAP), are seen as valuable and deserving of support. The focus of these programs and their evaluation should not focus on the receipt of grants, but should be broader, including efforts for getting students into college or training programs. The program needs clearly defined objectives and realistic means of measuring success. A program such as this can have a significant long range impact. (AA)

II. NHLBI should consider developing new funding mechanisms, and writing NHLBI supplemental guidelines to existing programs to promote recruitment and retention of minorities.

A. NHLBI should develop a new supplement program (Minority Education supplements to enhance K-12 education and infrastructure), to enable Principal Investigators of NHLBI grants to participate or assist in science education at local schools. (H).

B. NHLBI should establish Centers of Excellence without walls, in Heart, Lung and Blood related science education, to partner with local school districts, colleges and universities to allow NHLBI-funded scientists to become adjunct faculty to acquaint and train the school faculty in the latest scientific developments. (H)

C. NHLBI should develop transition programs to increase the number of research scientists from minority groups.

1. One transition program should fund training for career changes by clinicians who want to become basic scientists. Another program should fund training for non-scientists to become scientists. Both programs should stimulate scientific research that targets health problems of Hispanics and other minorities.(H)

2. NHLBI should co-fund new grant mechanisms such as the Native American Research Centers for Health (NARCH). (AI/AN)

3. Establish programs to transition AI/AN students at 2-year Tribal Colleges & Universities (TCUs) to 4-year programs and then to graduate schools. (AI/AN)

4. NHLBI should create mechanisms to support minority faculty or science faculty at minority serving institutions for sabbaticals for research training, and for support for research upon return. NHLBI should provide sabbatical support for minority faculty or science faculty at Minority Serving Institutions to get additional training. This support should consider inclusion of short-term research support once the sabbatical has been completed. One such model is the St. Scholastica program. (AA)

5. NHLBI should create a transition grant for young investigators. This grant would allow postdoctoral fellows to transition into an independent research careers at an academic institution or research center. This would be similar to the K22 program for the extramural community. The program should require a certain focus on African Americans. This should include a debt reduction program for underrepresented minority students. (AA)

III. Market and develop outreach campaigns.

A. Develop new communication strategies to inform the research community and minority target audiences about funding opportunities.

1. NHLBI should develop, pretest and disseminate messages, and then conduct aggressive marketing campaigns for all its research activities and funding mechanisms, and improve the interest of minority communities in scientific research careers. (H)

2. NHLBI should develop outreach programs to educate poor and low English literacy Hispanic parents and families on the value of science careers for their children. These programs could be modeled on after-school “hands-on-science” programs.(H).

3. NHLBI should extend marketing efforts beyond communities to TCUs and to AI/AN organizations outside of medicine. (AI/AN)

4. NHLBI should advertise in minority targeted publications, and non-traditional communication channels. There is a need for marketing to increase awareness both within the minority and majority communities. Educational/public relations programs from NHLBI through the Office of Prevention, Education and Control (OPEC) can highlight scientific careers. OPEC’s expertise should be utilized to highlight scientific careers and develop programs that will present science careers in a positive light, particularly with the African American community. Programs could be produced for use and dissemination at the local level. In particular, advertisement needs to be targeted to a minority audience. The use of minority targeted media and non-traditional media should be considered. Training directors and grantees should be required to advertise training positions in print or on web with funds provided. This

latter effort may be an area where the NHLBI may play a coordinating role. (AA)

B. Partner with other agencies, such as the Department of Education or National Science Foundation, and with community based organizations to strengthen K-12 science education.

1. NHLBI should collaborate with the Hispanic Association of Colleges and Universities, Historically Black Colleges and Universities and Tribal Colleges and Universities, and Federal agencies, such as the Department of Education, for the purpose of developing, implementing and evaluating innovative programs to increase the potential pool of Hispanic research scientists. These programs should be designed to conduct outreach activities in grades K-12; and improve science faculties and facilities in local school districts. (H)

2. NHLBI should support K-12 AI/AN schools to develop math and science courses. AI/AN communities need support for K-12 AI/AN schools to develop math and science courses tailored to unique AI/AN learning styles. Existing researchers should visit schools and community meetings to serve as role models and to explain current research and promote the value of scientific thinking in communities. (AI/AN)

3. NHLBI should create a traveling science exhibit that would visit TCUs and invite K-12 students to learn about science and scientific research. The exhibit should be hands-on and include inquiry-based science activities for different age groups. Research grants for AI/AN research should include funds for mentoring young AI/AN investigators and for partnering with TCUs. Although mechanisms for some of these activities exist, greater emphasis should be placed on publicizing their existence. (AI/AN)

4. NHLBI should focus educational/promotional efforts on recruitment and retention at kindergarten through the postdoctoral level. (AA)

5. NHLBI should support a mechanism that enables scientists to train K-12 science teachers and guidance counselors in science and science careers. NIH or the NHLBI could sponsor a week-long program on the NIH campus that would allow guidance counselors and science teachers to participate. Developing local programs for K-12 teachers and counselors in a geographical area might include a feasability study or pilot programs prior to full implementation. The NHLBI could also consider funding career development programs for individuals who wish to do the training (K mechanism). (AA)

6. NHLBI should utilize a mechanism such as Centers of Excellence to coordinate: summer training; school year training; recruitment and retention efforts; resource center; advising, that is, debt forgiveness,

career planning, test preparation, longitudinal model (K-12, college, graduate). NHLBI needs to provide support for the National Center for Minority Health and Health Disparities (NCMHHD) Centers of Excellence which will include longitudinal (K through 12, undergraduate and graduate) efforts at outreach and training. These Centers should include advising, counseling, and distance learning courses. NHLBI should also provide additional support for training on large grants including networks, SCORs, large clinical studies with a focus on minority training and recruitment. (AA)

IV. Facilitate collaborative partnerships between "research intensive" universities (AKA Carnegie Class I universities) and minority educational universities, colleges, community colleges and local school districts.

A. Upgrade the TCUs to provide scientific research training. Grants could be awarded to TCUs to set up partnerships with nearby research intensive institutions to build research laboratories at the TCUs and share faculty and students to upgrade opportunities for training. (AI/AN)

B. Encourage, with financial incentives, NHLBI-funded investigators to instruct local K-12 school faculty in scientific research, and science in general. (H)

V. Improve the mentoring environment for minorities, which in turn, will improve the environment for all trainees.

A. NHLBI should create a national mentoring program that would include survival skills, address recruitment and retention issues, facilitate, networking, and assist with career development. This program would be designed to retain young investigators in biomedical research. This mentoring system would emphasize the role of mentoring and mentors in the development of a research career. It would include discussions of grantsmanship, survival skills in the research and academic environment, networking, career advancement and development, and ways to recruit and retain individuals in biomedical science. (AA)

B. Conduct workshops to instruct potential mentors and trainees in "best practices" in mentoring. The curricula at these workshops should emphasize what both mentors and trainees need to know, the agreed-upon expectations for their respective roles, and requisite skills and behaviors to optimize the training experience. (H)

C. Develop NHLBI supplemental guidelines to promote good mentoring. Require that NHLBI-funded institutions train faculty in cultural awareness and sensitivity. Require that NHLBI-funded institutions adhere to" best practices" in mentoring.

1. Include, among the criteria for review of training and career development grant applications as well as non-competing renewals, experience and plans for developing good mentoring and accomplishments in this regard. (H)

2. Establish criteria that students can use to identify and select mentors with the requisite skills and appropriate characteristics, and to evaluate their mentors over the course of their training. (H)

3. Conduct mentoring of AI/AN students to specifically address AI/AN recruitment and retention rather than lumping them in with other groups. (AI/AN)

4. NHLBI should include funds for salary support for mentors and training faculty on Training Grants. Special requirements should be incorporated to also provide support for staff responsible for recruitment and retention. Mechanisms for students to organize and develop networks; to evaluate what the institution is doing to help students. Because there is a need to look at long range effects of training, not just single interventions, existing or newly developed training programs should focus on the pipeline and include a career continuum. In particular, training programs that focus on African Americans and underrepresented minorities from high school through the post graduate level should be encouraged. (AA)

5. Consider developing incentives to promote good and deter poor mentoring. (H)

D. Provide mentors with training in "how to mentor" and provide trainees with information about good mentorship. That is, create a program of "best practices in mentoring" that will be used for university administrators, mentors and trainees.

1. NHLBI should develop and enforce policies that assure compliance with best standards in mentoring. These assurances, should be a component of grant and contract agreements, and could be worded like other assurances for radiation safety, human subject protection, etc. (H)

2. Funds should be allocated to T32 Training Directors to develop and monitor appropriate mentoring programs for mentors and trainees. There should be mechanisms to allow investigation of *bona fide* complaints, and for auditing the institution's mentoring practices by the NHLBI, with provisions for creating effective remedies in cases of infraction and for protecting the identities of individuals involved in both sides of the complaints. The Robert Wood Johnson Foundation has procedures that can serve as a model for NHLBI to develop guidelines to address these issues in training and career development grants.(H)

3. Extend mentoring of AI/AN students to include more effective use of layered mentoring. (AI/AN)

VI. Additional Recommendations

A. Adjust eligibility criteria for solicitations to include Tribes, TCUs, and AI/AN organizations.

The Institute should consider earmarking some solicitations specifically for AI/ANs for an initial period. Alternatively, multi-phase solicitations and cooperative agreements could be used to provide training and build infrastructure in AI/AN communities. Other approaches to provide technical assistance might also be explored. (AI/AN)

B. Research projects conducted in AI/AN communities should include the community as a partner.

Research funded in AI/AN communities should include a community component to assure that there is community input in the conduct of the research. This is often necessary but rarely available through the R01 mechanism. Partnerships would be ideal. (AI/AN)

C. Work with the Indian Health Services (IHS) to encourage their physicians to apply for research grants.

To increase exposure to research and to mentors and role models, it would be helpful if the IHS would encourage their physicians to apply for research grants so more opportunities exist in AI/AN communities, however, time for their implementation by busy clinicians would also have to be part of such an action. NHLBI should develop a partnership with AI/AN organizations to increase research exposure and training opportunities. Examples include the United National Indian Tribal Youth, Inc. (UNITY) to provide funds for students to attend scientific conferences and mentor students, American Indian Science and Engineering Society (AISES) to recruit students for biomedical research, Association of American Indian Physicians (AAIP) to recruit peer reviewers and mentors, and programs like InMed and Headlands to support AI/AN physicians to conduct research. Programs and laws should be modified for approaches to pay back medical school support through research in AI/AN communities as equivalent to the practice of clinical medicine in those communities. (AI/AN)

D. Include funding to cover dissemination of results to students and communities for studies that are ongoing. (AI/AN)

E. NHLBI should develop and implement guidelines for review and evaluation of research grants that contain graduate students and postdoctoral fellows should include an assessment of training benefits. (AA)

In addition, to a review of scientific technical merit, competing renewal grants should be judged on their training capabilities. Requiring applicants to explicitly focus on mentoring and training on research grants to raise the level of attention that training efforts receive. (AA)

Appendix 1

Agenda

Workshop on Recruitment and Retention of African Americans, Hispanic Americans, and Native Americans in Scientific Research Careers Relevant to Heart, Lung, Blood, and Sleep Disorders:

What Works, What Doesn't and What Should We Do?
Natcher Auditorium, NIH
May 24-25, 2001

Agenda

Thursday, May 24, 2001

7:30 AM	Registration and Continental Breakfast in the Lobby
8:15 AM	Introduction and Charge to the Workshop: Dr. Claude Lenfant (NHLBI, NIH)
Session I:	**The Problem and the Pipeline (Moderator: Dr. Cage Johnson, USC)**
8:30 AM	Scope of the Problem: What Do the Data Tell Us?: Dr. Jean Flagg-Newton (NCMHD, NIH)
8:50 AM	The Science Pipeline: Dr. Nirmala Kannankutty (National Science Foundation)
9:10 AM	Panel Discussion (Moderator: Dr. Cage Johnson, USC)
Session II:	**Building to the Future, Part I (Moderator: Dr. Charles Peterson, NHLBI, NIH)**
9:25 AM	Cultural Marketing to Minorities: Dr. John Graham (UC Irvine)
9:45 AM	Discussion on Cultural Marketing (Moderator: Dr. Charles Peterson, NHLBI, NIH)
9:55 AM	Break
Session III:	**Student Perspectives (Moderator: Dr. Michael Commarato, NHLBI, NIH)**
10:15 AM	African American Perspective: Mr. Patrick Hines (UNC)
10:30 AM	Native American Perspective: Patricia Nez Henderson, M.D., M.P.H. University of Colorado Health Sciences Center, Black Hills Center for American Indian Health
10:45 AM	Hispanic American Perspective: Ms. Edna Gordian (Univ. Puerto Rico)

Session IV: Innovative NIH Programs (Moderator: Dr. Patrice Desvigne-Nickens, NHLBI, NIH)
(15 minute presentations followed by 5 minutes for questions/answers)

11:00 AM National Institute of General Medical Sciences (NIGMS): Dr. Clifton Poodry

11:20 AM National Cancer Institute (NCI): Dr. Sanya Springfield

11:40 AM National Institute of Mental Health (NIMH): Dr. Enid Light

12:00 PM Lunch

Session V: Innovative Private & Public Programs (Moderator: Dr. Jared Jobe, NHLBI, NIH)
(15 minute presentations followed by 5 minutes for questions and answers)

1:00 PM The Sophie Davis NYC Program: Dr. Louis L. Cregler (CUNY)

1:20 PM Kellogg Foundation: Dr. Gloria Smith

1:40 PM The St. Scholastica Program: Dr. Chandra Mehrotra (College of St. Scholastica)

2:00 PM University of Colorado Native American & Alaska Native Programs:
Dr. Spero Manson

2:20 PM The APA Minority Fellowship Program: Over 25 years of Experience:
Dr. Kim Nickerson (APA)

2:40 PM Weill Cornell/Rockefeller/Sloan-Kettering
Gateways to the Laboratory Program: Mrs. Ruth Gotian (Cornell)

3:00 PM Break

Session VI: Building to the Future, Part II (Moderator: Dr. Charles Peterson, NHLBI, NIH)

3:20 PM Charge to the Breakout Groups: Dr. Charles Peterson (NHLBI, NIH)

3:30 PM - 5:30 PM
Three Breakout Groups will meet separately to discuss group specific issues and begin to develop recommendations. Break at 5:30 PM

6:15 PM Dinner
Speaker: Dr. James R. Gavin (Howard Hughes Medical Institute)

Friday, May 25, 2001

7:30 AM Continental Breakfast

8:00 AM Breakout Groups continue discussions and development of recommendations

Session VII: Recommendations (Moderator: Dr. Cage Johnson, USC)

10:30 AM African American breakout group report

10:50 AM Hispanic American breakout group report

11:20 AM Native American breakout group report

11:30 AM - 12.30 PM
Overall Recommendations of the Workshop to NHLBI

12.30 PM Adjourn

5/24/01

Workshop Web Site located at: http://www.nhlbi.nih.gov/meetings/dbdrmin/index.htm

SPECIAL NOTE FOR PEOPLE WITH DISABILITIES:

Sign Language Interpreters will be provided. If you require reasonable accommodations to participate in this activity, please check the box on the registration form or contact Ms. Mary Stewart at 301 435-005.

Appendix 2

Breakout Groups (Core participants)
What Works, What Doesn't Work, What Should We Do?

African American	Hispanic American	Native American
Facilitators: Joyce Hunter, Ph.D. and John Fakunding, Ph.D.	Facilitators: Sri Ram, Ph.D. and Ellen Werner, Ph.D.	Facilitators: Richard Fabsitz, M.A. and Jared Jobe, Ph.D.
Horace Delisser, M.D. University of Pennsylvania	Samuel M. Aguayo, M.D. Emory University	Carolyn Barcus, EdD Utah State University
Jean Ford, M.D. Columbia Univ./Harlem Hospital	Miguel Bedolla, M.D., Ph.D., MPH Health Careers Opportunities Program-UTHSCSA	Theresa Clay, M.S. University of New Mexico
Sandra Harris-Hooker, Ph.D. Morehouse School of Medicine	Sonia Flores, Ph.D. University of Colorado Health Sciences Center, Webb-Waring Institute	Tim J. Gilbert Alaska Native Tribal Health Consortium
Patrick Hines University of North Carolina	George Friedman-Jimenez, M.D. NYU School of Medicine	Patricia Nez Henderson, M.D., M.P.H. University of Colorado Health Sciences Center, Black Hills Center for American Indian Health
Warren Lockett, M.D. Wayne State University	Joe G.N. Garcia, M.D. Johns Hopkins University School of Medicine	Felicia Schanche Hodge, Ph.D. University of Minnesota/Center for American Indian Research & Education
Dana McDowelle, Ph.D. Xavier University	Milton J. Hernandez, Ph.D. National Institute of Allergy and Infectious Diseases	Walt Hollow, M.D. University of Washington
Hattie Myles, Ph.D. University of South Alabama College of Medicine	Fernando Martinez, M.D. University of Michigan Medical School	Brett Koplin M.D. Mayo Clinic
Roland Owens, Ph.D. National Institute of Diabetes and Digestive and Kidney Diseases	Jose Martinez, M.D. Jefferson Medical College Thomas Jefferson University	
James Phillips, M.D. Baylor College of Medicine		

Breakout Groups, continued

African American	Hispanic American	Native American
Facilitators: Joyce Hunter, Ph.D. and John Fakunding, Ph.D. Joan Reede, M.D. Harvard Medical School Anthony Rene, Ph.D. National Institute of General Medical Sciences Shirley B. Russell, Ph.D. Meharry Medical College Moses Williams, M.D. Temple University	Facilitators: Sri Ram, Ph.D. and Ellen Werner, Ph.D. Tanya Pagan Raggio, M.D., MPH The Sophie Davis School City University of New York Medical School	Facilitators: Richard Fabsitz, M.A. and Jared Jobe, Ph.D. Clifton Poodry, Ph.D. National Institute of General Medical Sciences Lillian Tom-Orme, Ph.D., MPH, RN, FAAN Utah Department of Family & Preventive Medicine

Appendix 3

Invited Participants

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